OBSERVATIONS ON NESTING SITES OF THE WELCOME SWALLOW, *HIRUNDO TAHITICA*, ON THE EASTERN FRINGE OF LAKE ELLESMERE, CHRISTCHURCH

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ABSTRACT

Records of nesting activity of a population of the welcome swallow, *Hirundo tahitica*, from December 1969 to October 1972, are presented. These data reveal an expanding population, and this is discussed with reference to possible influencing factors. Suggestions are made for more detailed study.

INTRODUCTION

The purpose of this paper is to present data collected over four breeding seasons (1969 - 1972) on the nesting activity of a selected population of welcome swallows, nesting under culverts on the Christchurch to Akaroa highway. The survey supplements observations by Turbott (1963) and Tunnicliffe (1968), and provides an insight into the population growth of this newly established species.

METHODS

In the breeding seasons of 1969, 1970, 1971 and 1972, a record of nests was kept for each culvert along about 19 km (12 miles) of Provincial State Highway 75 between Tai Tapu and Prices Valley Road. Many nests were inaccessible and could not be examined due to the size of the culvert, or the water level. The survey did not incorporate elements of the welcome swallow population which are known to be nesting elsewhere about the area, e.g., Kaitorete Spit (Tunnicliffe 1968).

Field observations were made on the welcome swallows, other fauna (e.g., invertebrates and other birds), and the physical aspects of the area adjacent to each culvert. The number of nests recorded includes incomplete nests, but not mud patches indicating where nests have become detached. Occasional records were kept on the number of eggs and chicks for a few specific nests.

OBSERVATIONS

The data obtained from the survey are summarised in Table 1.

The first nesting recorded in the broad area of the present survey occurred at Lakeside during the 1961 - 1962 season (Turbott 1963).

Welcome swallows were seen consistently about most culverts

TABLE 1. LOCALITY, CULVERT SHAPE AND NUMBER OF NESTS IN EACH CULVERT FROM DEC. 1969 - OCT. 1972

Culvert no.	Grid Reference	Culvert shape	No. of nests Dec. 1969	Dec. 1970	Dec. 1971	Mar. 1972	Oct. 1972
1	930 389	c	0	0	1		1
2	932 372	c	0	0	0		0
3	941 356	a	-	-	0		0
4	945 337	c	1	2	3		4
5	962 323	c	0	0	2		5
6	973 324	c	0	0	1		2
7	978 320	a	-	-	0		0
8	979 318	b	1	-	1		4
9	978 304	a	-	-	0		0
10	997 283	c	4	9	14	10	17
11	006 268	c	1	3	3	3	4
12	017 265	b	0	1	1	1	1
13	020 259	a	-	-	0	0	1
14	021 255	a	-	-	0	1	0
15	038 244	a	-	-	0	0	0
16	040 243	a	-	-	1	1	0
17	041 243	a	-	-	0	0	0
18	042 242	c	1	-	1	1	1
19	042 242	b	0	-	0		0
20	044 241	a	-	-	0		0
21	044 241	c	0	-	0		2
No. of culverts used:			5+	4+	10		11
Total no. nests:			8+	15+	28		42

Footnotes to table:

Culvert shape: (a) round culvert, (b) bridge, (c) square culvert.

The culverts are assigned numbers in sequence between Tai Tapu (1) and Prices Valley Road (21). Multiple culverts are counted as one.

A blank (-) indicates lack of data.

Birds were seen about culvert 6 (Dec. 1970), and 13 (Dec. 1971), though nests were absent. Culvert 10, at Kaituna, is that mentioned by Tunnicliffe (1968), containing 3 nests in Nov. 1966 and Dec. 1967.

Grid references apply to sheets S 84, and S 94 of New Zealand Map Series 1.

The observations for culverts 10-18 for Mar. 1972 were made by J.F. Castle (pers. comm.) and provide a comparison with those by the author in the same season in Dec. 1971.

containing nests; however, as each observation was made over a short space of time, absence of birds at a culvert may not necessarily imply that nests present are unused.

DISCUSSION

The number and distribution of nests can be taken as an index of the population density and distribution. This assumes that the presence of a nest indicates the presence of a breeding pair, and that nests where are not damaged are re-used. Observations by E.D. Moore (pers. comm.) confirm this assumption.

The data show that the welcome swallow population under investigation in the present survey is expanding its range, and increasing in numbers.

Edgar (1966: 49, 50, 51) reported that, with up to 5 eggs per clutch, and 3 clutches per season, there was a 52% loss during the egg and chick stage due to infertility, nest falling, and human or other predation. He reported nest predation by rats, and nest appropriation by sparrows. In one season 25 breeding pairs produced an average of 5.4 flying young per pair (Edgar 1966: 50). These data were obtained in Northland.

The population increase shown in the present survey may be due to supplementary immigration, but applying Edgar's productivity figures to the local population, this would presume a relatively low fertility rate.

From field observations, it seems that welcome swallows prefer square culverts above running water for nest sites. Most round culverts in the area studied are of small diameter (ca. 1 m) and consequently subject to flooding. This may have occurred in culvert 16. Most of the culverts with nests when observed had a clearance above the water of 1 - 2 m. All but one square culvert, 2, with a clearance of ca 0.2 m above the water, had nests present.

Edgar (1966: 37) noted relatively few instances where there were more than 2 nests per site in Northland, and assumed that "a proportion of the swallow population has a tendency to a mild form of colonial nesting". Culvert 10, with 17 nests in 1972, confirms this tendency. The distance bewteen nests in culvert 10 was estimated to vary between 0.1 m and 1 m. Intra-specific competition for nest sites may be a significant causal factor in the expanding distribution of the welcome swallow.

Edgar (1966: 59) stated that "Such information as is available indicates that the population increase and spread of the swallow in these southerly areas (south of Northland) is proceeding more slowly than was the case in Northland". The data in the present survey indicates that the population is either rapidly expanding or redistributing. G.T. Harding (pers. comm.) reports welcome swallows breeding at Waikuku in the 1971/72 and 1972/73 seasons. The continued breeding presence of welcome swallows in areas adjacent to that of the present survey suggests that this population is expanding. The presence of a favourable vacant niche has probably influenced the welcome swallows' initial colonization of this area. Other birds, such as skylarks

and sparrows, which frequent this mixed farmland area with its abundant insect life about the drainage channels, were seldom seen in the immediate vicinity of the welcome swallows' feeding loci.

CONCLUSIONS AND SUGGESTIONS FOR FUTURE STUDY

The welcome swallow population investigated is increasing and may not yet have stabilized. Any attribution of this phenomenon to specific factors at this stage is only tentative: a more thorough investigation is needed to determine the factors involved. It would be unfortunate if this opportunity was not taken to follow the establishment and expansion of a population and its ecological impact upon the environment, with such an accessible species as the welcome swallow.

G.A. Tunnicliffe (pers. comm.) suggests that for a more thorough study of welcome swallows, coloured (patagial) wing tags could be attached to birds for individual identification. The birds could easily be captured in a mist net extended across the ends of the culvert. Such identification would enable the individuals' movements, both seasonal and over shorter periods, to be recorded. These techniques would allow detailed studies of the breeding biology and population dynamics of the welcome swallow.

P.M. Johns (pers. comm.) analysed four welcome swallow faecal pellets, and found them to be mainly composed of many fragments of *Ephydrella* spp. (Diptera: Ephydridae), and one with *Ephydrella* sp. and *Notogonum submetallicum* (Coleoptera: Carabidae) elytra, pieces of one other Coleopteran, and a Lepidopteran leg and scales. He suggested that further studies could be made on the feeding behaviour of these birds and the relationship of feeding to the abundance of insects, especially *Ephydrella* spp. (probably *novaezealandica* and *aquaria*).

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